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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/752,134	12/27/2000	Gilbert Neiger	042392.P9770	8719

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EXAMINER	
SCHUBERT, KEVIN R	
ART UNIT	**PAPER NUMBER**
2137	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/752,134	NEIGER ET AL.	
	Examiner	Art Unit	
	Kevin Schubert	2137	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9,11 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9,11 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 7,9,11, and 13 have been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The following claim amendment is not supported by the specification:

> "if the interrupt flag controls masking of interrupts, exiting said processor mode to transfer control over the operation to a virtual machine monitor running outside said processor mode"

The examiner finds no support for this limitation in the specification or drawings. In the specification, the applicant describes a process whereby an attempt of the guest software to modify an interrupt flag is identified (804 of Fig 8). A decision is then made as to whether the interrupt flag controls masking of interrupts (806 of Fig 8). However, if the interrupt flag controls masking of interrupts, the system does not exit the processor mode but rather checks to see if there is a shadow interrupt flag (810 of Fig 8). Only after having checked for a shadow interrupt flag **and** after confirming that a shadow interrupt flag does not exist does the system generate a virtualization trap (812 of Fig 8) and exit the processor mode to transfer control over to a vmm (816 of Fig 8). The applicant's specific claim limitation is not supported. Appropriate correction to the claim or a specific reference to where this claim limitation is present in the specification is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Robinson, U.S. Patent No. 5,522,075.

As per claim 7, the applicant describes a method comprising the following limitations which are met by Robinson:

a) reporting an ability of a processor to support a processor mode that enables guest software to operate at a privilege level intended by the guest software, using one of a plurality of reserved feature bits that are returned in a processor register (Col 14, lines 12-15);

b) responsive to an attempt of the guest software to perform an operation restricted by said processor mode, exiting said processor mode to transfer control over the operation to a virtual machine monitor running outside said processor mode (Col 12, lines 50-60).

As per claim 9, the applicant describes a method comprising the following limitations which are met by Robinson:

a) running guest software in a processor mode that enables the guest software to operate at a privilege level intended by the guest software (Col 14, lines 12-15);

b) identifying an attempt of the guest software to perform an operation restricted by said processor mode (Col 12, lines 50-53);

c) determining that the attempt of the guest software would succeed if the guest software was running outside said processor mode (Col 12, lines 20-53).

d) exiting said processor mode to transfer control over the operation to a virtual machine monitor running outside said processor mode (Col 12, lines 50-60).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spear, U.S. Patent No. 5,237,669 in view of Robinson.

As per claim 11, the applicant describes a method comprising the following limitations which are met by Robinson and Spear:

a) running guest software in a processor mode that enables the guest software to operate at a privilege level intended by the guest software (Robinson: Col 14, lines 12-15);

b) identifying an attempt of the guest software to modify an interrupt flag (Spear: Col 20, lines 20-31);

c) if the interrupt flag controls masking of interrupts, exiting said processor mode to transfer control over the operation to a virtual machine monitor running outside said processor mode (Spear: Col 20, lines 20-31);

d) modifying the interrupt flag if the interrupt flag does not control masking of interrupts;

Spear discloses identifying an attempt to modify an interrupt flag and then performing a security function as a result of the identification of the restricted action. Spear does not disclose that the security function is exiting the processor mode to transfer control over to a VMM. Robinson discloses a similar system in which the identification of a restricted action results in this security function. Combining the

ideas of Robinson with those of Spear would allow the security function to be transferring control over to a VMM so that the restricted action is blocked from executing normally and causing damage. It would have been obvious to one of ordinary skill in the art at the time the invention was filed to combine the ideas of Robinson with those of Spear because doing so prevents a restricted action such as modifying an interrupt flag from executing normally in the system and potentially causing damage.

As per claim 13, the applicant describes a method comprising the following limitations which are met by Robinson and Spear:

a) running guest software in a processor mode that enables the guest software to operate at a privilege level intended by the guest software (Robinson: Col 14, lines 12-15);

b) identifying an attempt of the guest software to modify an interrupt flag (Spear: Col 20, lines 20-31);

preventing the attempt of the guest software to modify the interrupt flag, including:

c) if a shadow interrupt flag is provided, allowing the guest software to modify the shadow interrupt flag;

d) if a shadow interrupt flag is not provided, exiting said processor mode to transfer control over the operation to a virtual machine monitor running outside said processor mode (Robinson: Col 12, lines 50-60).

Response to Arguments

Applicant's arguments filed 6/22/05 with respect to claim 7 have been fully considered but they are not persuasive. The applicant argues "the VM-bit of Robinson does not report an ability of a processor to support VM mode" (See Remarks, page 1). The examiner disagrees. The VM bit, as correctly pointed out by the applicant, indicates whether the processor is in the VM mode or not. If the VM bit is set, the processor is in the VM mode. Furthermore, the VM bit may be checked in order to report whether the processor is in the VM mode. If a report is received indicating that the processor is in VM mode, this report indicates that the processor supports a VM mode.

Applicant's arguments with respect to claim 9 have been fully considered but they are not persuasive. The applicant argues that Robinson does not describe determining if an attempt would succeed if the guest software were running outside said processor mode. The examiner disagrees. Robinson discloses running a system in a specific VM mode where restricted instructions are trapped. Instructions are designated as restricted if their performance generates system faults, such as halting the execution of the processor (Col 12, lines 34-37). If the guest software were running outside the specific VM mode in a normal mode in which virtualization traps did not occur, the execution of restricted instructions would cause damage to the system. In order to counterbalance this, the system described by Robinson identifies attempts to perform restricted actions (part b) and then determines whether these restricted actions would succeed in causing damage if the system were running in a mode without virtualization traps by comparing the attempted restricted action to stored restricted actions known to cause damage (part c) (Col 12, lines 50-60).

Applicant's arguments with respect to claim 11 have been considered but are moot in view of the new ground(s) of rejection. The examiner notes the claim limitation "modifying the interrupt flag if the interrupt flag does not control masking of interrupts". The applicant claims that the step of "modifying the interrupt flag" only takes place if the interrupt flag does not control masking of interrupts. In the passage, the interrupt flag does control masking of interrupts. Thus, the step of modifying the interrupt flag does not take place.

Applicant's arguments with respect to claim 13 have been considered but are moot in view of the new ground(s) of rejection. Again, the examiner points out the claim limitation "if a shadow interrupt flag is provided, allowing the guest software to modify the shadow interrupt flag". This claim limitation is only applicable IF a shadow interrupt flag is provided. A shadow interrupt flag is not provided in the system.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Schubert whose telephone number is (571) 272-4239. The examiner can normally be reached on M-F 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3868. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KS

EMMANUEL L. MOISE
SUPERVISORY PATENT EXAMINER